Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (Currently Amended) A method for ~~compensating~~ obtaining a measure of the thermal conductivity of a first component of a fluid of interest that include the first component and two or more other components using a thermal conductivity sensor, the thermal conductivity sensor having ~~that includes~~ a heater and a temperature sensor, wherein each of said heater and said temperature sensor are in thermal communication with the [[a]] fluid of interest, ~~and wherein the fluid of interest includes a first component and two or more other components,~~ the method comprising the steps of:

determining the variability range of at least one of the two or more other components in the fluid of interest;

energizing the heater with an input signal to induce an elevated temperature condition in said heater, the elevated temperature condition being such that the combined thermal conductivity of the two or more other components is less variable with concentration of the two or more other components than the individual thermal conductivities of the two or more other components; and

obtaining a measure of the thermal conductivity of the first component using said temperature sensor.

2. (Previously Presented) The method of claim 1 wherein at least one of the two or more other components includes H_2O and at least one of the two or more other components includes CO_2, the method further comprising the steps of:

determining the variability range of CO_2 in the fluid of interest.

3. (Previously Presented) The method of claim 1 wherein at least one of the two or more other components includes H_2O, the method further comprising the step of selecting the elevated temperature condition for said heater by:

measuring the thermal conductivity of the fluid of interest over a range of temperatures; and

selecting the elevated temperature based on the thermal conductivity measurements to reduce the effect of H_2O.

4. (Previously Presented) The method of claim 2 further comprising the step of selecting the elevated temperature condition for said heater by:

measuring the thermal conductivity of the fluid of interest over a range of temperatures; and

selecting the elevated temperature based on the thermal conductivity measurements to reduce the combined effects of H_2O and CO_2.

5. (Currently Amended) A fluid sensor for determining a selected property of one or more components in a fluid of interest, comprising:

a heater;

a thermal sensor in proximate position to said heater and in thermal communication therewith through the fluid of interest, said sensor having a temperature dependent output;

measuring means for obtaining a measure of the selected property of at least one of the one or more components of the fluid of interest using said temperature sensor; and

energizing means connected to said heater for energizing the heater to induce an elevated temperature condition in said thermal sensor[[;]], wherein said elevated temperature condition is selected to reduce the effect of at least one of the components in the fluid of interest on the selected property that is measured by the measuring means.

~~measuring means for obtaining a measure of the selected property of at least one of the one or more components of the fluid of interest using said temperature sensor; and~~

~~wherein said elevated temperature condition is selected to reduce the effect of at least one of the components in the fluid of interest on the selected property that is measured by the measuring means.~~

6. (Previously Presented) The fluid sensor of claim 5 wherein at least one of the one or more components includes H20 and at least another of the one or more components includes C02, and said elevated temperature condition is selected to reduce the effect of H_20 and CO_2.

7. (Previously Presented) The fluid sensor of claim 5 wherein said fluid sensor is used to sense hydrogen concentration in the fluid of interest.

8. (Previously Presented) The fluid sensor of claim 5 wherein the fluid of interest includes a gas.

9. (Currently Amended) A method of compensating an output <u>of</u> a fluid sensor that includes a heater and a temperature sensor, comprising:

determining the range of H_2O in the fluid to be sensed;

selecting a heater temperature to reduce the effect of H_2O on the output of the fluid sensor; and

heating the fluid to be sensed using the heater to the selected temperature value.

10. (Previously Presented) The method of claim 9 further comprising the steps of:

determining the range of CO_2 in the fluid to be sensed; and

selecting the heater temperature value to reduce the effect of CO_2 on the fluid sensor.

11. (Previously Presented) The method of claim 9 wherein the selected temperature is chosen to reduce non-linear sensor resistance values caused by the H_20 in the range of H_2O concentration.

12. (Previously Presented) The method of claim 9 wherein the selected temperature is chosen to reduce non-linear sensor resistance values caused by the CO_2 in the range of CO_2 concentration.

13. (Currently Amended) A method for ~~compensating~~ obtaining a measure of the thermal conductivity of a first component of a fluid of interest that include the first component, a second component and a third component using a thermal conductivity sensor ~~that includes~~, the thermal conductivity sensor having a heater and a temperature sensor, wherein each of said heater and said temperature sensor are in thermal communication with [[a]] the fluid of interest, and wherein the ~~fluid of interest includes a first component, a~~ second component of the fluid of interest ~~that~~ includes polar or non-symmetrical molecules, and [[a]] the third component of the fluid of interest ~~that~~ includes non-polar or symmetrical molecules, the method comprising the steps of:

determining the variability range of the second component and/or the third component in the fluid of interest;

energizing the heater with an input signal to induce an elevated temperature condition in said heater, the elevated temperature condition being such that the combined thermal conductivity of the second component and the third component is less variable with concentration of the second component and the third component than the individual thermal conductivities of the second component and the third component; and

obtaining a measure of the thermal conductivity of the first component using said temperature sensor.

14. (Previously Presented) The method of claim 13 wherein at least one of the first and second components includes H_2O, the method further comprising the step of selecting the elevated temperature condition for said heater by:

measuring the thermal conductivity of the fluid of interest over a range of temperatures; and

selecting the elevated temperature based on the thermal conductivity measurements to reduce the effect of H_2O.

15. (Currently Amended) A fluid sensor to sense hydrogen concentrations comprised of:

a thin film heater;

at least one thin film temperature sensor;

a semiconductor body with a depression therein; and

the heater and temperature sensor lying in a plane substantially parallel to the semiconductor body;

an energizer coupled to said heater, said energizer providing a control signal to said heater to induce a predetermined temperature proximate to the heater, said temperature being preselected to reduce the effect of ~~a fluid from the group consisting of~~ H_2O.

16. (Original) The fluid sensor to sense hydrogen concentrations of claim 15 wherein said fluid sensor is operable to monitor hydrogen in a proton exchange membrane fuel cell.

17. (Original) The fluid sensor to sense hydrogen concentrations of claim 15 wherein said fluid sensor is operable to monitor the fluid mixture composition of one or more refrigerants.

18. (Previously Presented) The method of clam 1 wherein the elevated temperature condition for said heater may be configured in the field.

19. (Previously Presented) The method of claim 13 wherein the elevated temperature condition for said heater may be configured in the field.

20 - 21. (Cancel)

22. (Currently Amended) A method for compensating an output of a fluid sensor that includes a heater and a temperature sensor, comprising:

determining the range of H_2O and CO_2 in the fluid to be sensed;

energizing the heater in the fluid to be sensed to one or more temperatures and varying the amount of H_2O and CO_2 in the fluid to be sensed while monitoring the output of the fluid sensor;

selecting a heater temperature value to reduce the effect of H_2O and CO_2 on the output of the fluid sensor; and

heating the fluid to be sensed using the heater to the selected temperature value.

23. (Previously Presented) The fluid sensor of claim 8 wherein the output of the sensor is used to control the concentration of individual components resulting from mixing at least two components.

24. (Cancel)

25. (Previously Presented) The fluid sensor of claim 5 wherein the fluid of interest includes a liquid.

26. (Previously Presented) The fluid sensor of claim 5 wherein the fluid of interest includes a refrigerant.

27. (Previously Presented) A method for determining the thermal conductivity of a first component in a fluid stream, wherein the fluid stream includes the first component and two or more other components, each having a thermal conductivity, wherein an approximately relative concentration of the two or more other components is known, the method comprising the steps of:

exposing a thermal conductivity sensor to the fluid stream, wherein the thermal conductivity sensor includes a heater and a temperature sensor;

elevating the temperature of the heater to an elevated temperature where the combined thermal conductivity of the two or more other components is less variable with concentration of the two or more other components than the individual thermal conductivities of the two or more other components; and

obtaining a measure of the thermal conductivity of the first component using the temperature sensor.

28. (Previously Presented) A method according to claim 27 wherein, at the elevated temperature, the combined thermal conductivity of the two or more other components is relatively constant over a range of concentrations of the two or more other components.

29. (Previously Presented) A method according to claim 27 wherein, at the elevated temperature, the combined thermal conductivity of the two or more other components does not substantially affect the measure of the thermal conductivity of the first component.

30. (Previously Presented) A method according to claim 29 wherein, at the elevated temperature, the thermal conductivities of the two or more other components substantially cancel each other out, so that the measure of the thermal conductivity of the first component can more easily be obtained.

31. (Previously Presented) A method according to claim 27 wherein the two or more other components include a second component and a third component.

32. (Previously Presented) A method according to claim 31 wherein the second component includes H_2O.

33. (Previously Presented) A method according to claim 32 wherein the second component includes CO_2.

34. (Previously Presented) A method for determining the thermal conductivity of a first component in a fluid stream, wherein the fluid stream includes the first component and two or more other components, each having a thermal conductivity, wherein an approximately relative concentration of the two or more other components is known, the method comprising the steps of:

exposing a thermal conductivity sensor to the fluid stream, wherein the thermal conductivity sensor includes a heater and a temperature sensor;

elevating the temperature of the heater to an elevated temperature;

obtaining a measure of the thermal conductivity of the first component using the temperature sensor; and

wherein the elevated temperature is such that the thermal conductivities of the two or more other components substantially cancel each other out so that the measure of the thermal conductivity of the first component can more easily be obtained.